Amendments to the Specification:

Please replace the paragraph beginning at page 8, line 9 with the following amended paragraph:

In step 302, the input power of the input signal is detected, for example using photo detector 220 202. In step 304, a ratio R is defined of the residual pump power and the injected pumping power of the pumping signal for a given application. The ratio R is a design feature typically associated with the performance of a given EDFA. In this way, the ratio R can be seen as an expected ratio that reflects the designed performance of the amplifier. When an EDFA is designed and built, the ratio R has been assumed. In general, a fitting linear equation can be used to calculate the ratio when different input power is considered. Calibration may be required to fit the linear equation. In one implementation, R is a design parameter for special gain. For example, when an EDFA's gain is designed as G (the gain desired), the ratio of residue power to initial pumping power should be R, which is set as a reference. As will be discussed below, if the measured real ratio RR is not equal to R (or within a tolerance), the pump power will be adjusted until the measured ratio is within the tolerance.